HITACHI
Inspire the Next

# Hitachi CinemaStar™ 7K1000

## 3.5-INCH CE HARD DISK DRIVES

Industry's first terabyte hard disk drive for consumer electronics and commercial devices

### Highlights

- Storage capacities: 1 TB, 750 GB
- Perpendicular magnetic recording technology
- SATA 3.0 Gb/s interface
- SMART command transport and Smooth-stream technology optimize A/V streaming
- Silent-seek acoustics for ultra-quiet operation
- Ramp load design increases shock protection and power savings
- Thermal monitoring and fly height control enhance reliability
- Three low-power idle modes boost power efficiency
- Handles up to 10 SD/HD streams simultaneously
- Drive authentication for HDD security

### Applications

- HD DVRs
- DVD/HDD recorders
- DVR-capable set-top boxes (STBs) and TVs
- Digital audio jukeboxes
- Media servers
- Surveillance DVRs

1 TB, 750 GB | 7200 RPM | Serial ATA 3.0 Gb/s

### 1-Terabyte drive video storage capacities

| | format | rate | hours |
|---|---|---|---|
| Camcorder | DV | 28 Mb/s | 79 |
| Std. Definition | MPEG-4 | 2.2 Mb/s | 1010 |
| High Definition | MPEG-4 | 9 Mb/s | 247 |

An industry first, the Hitachi CinemaStar™ 7K1000 hard disk drive delivers up to one terabyte of storage capacity for demanding consumer electronics (CE) devices. It leverages the industry's most reliable perpendicular magnetic recording (PMR) techniques and the latest advancements in silent acoustics, shock protection, and head technology to maximize capacity, performance and reliability. Best-in-class power management and thermal emissions help manufacturers meet energy compliance targets and extend drive life. Optimized for exceptional quality of service (QoS) in streaming applications, CinemaStar 7K1000 is ideal for recording and playback of today's high-definition (HD) formats.

### Proven PMR technology

Field-proven in 2.5-in. drives, Hitachi's PMR implementation continues to demonstrate reliability equal to or exceeding conventional longitudinal technology. The CinemaStar 7K1000's second-generation PMR head and media technology improve noise characteristics and thermal stability.

### Exceptional streaming audio/video

CinemaStar 7K1000's advanced firmware improves data integrity and optimizes QoS to meet the deadlines in streaming applications. Together, the SMART command transport protocol and Hitachi Smoothstream™ technology minimize disruptions in stream delivery by adapting buffer management behavior and error recovery timing to match the characteristics of typical streaming applications.

### Silent seek acoustics

Optimized for ultra-quiet operation, sound emissions during idle and seek operations are virtually undetectable by the human ear. There's no disruption to entertainment or to other activities during background recording.

### Reduced power idle modes

Unique to Hitachi drives, the CinemaStar 7K1000 features three advanced low-power idle modes – active, unload and low-power. Together, they reduce power consumption at the drive level up to 20%, optimize non-operational latency and lower drive temperature for cooler system operation.

### Outstanding shock resistance and power efficiency

Through a patented ramp load/unload design disk heads (in non-operating modes) are unloaded to a ramp outside the disk where they rest in a low-power 'unload idle' state until activated. In low RPM drives, this can reduce power by up to 50%. Ramp load/unload provides tangible benefits for the drive and end product. It greatly minimizes the risk of shock damage by eliminating direct contact between the heads and disks. Reduced wear and heat improve overall drive reliability. In the event of power loss to the drive, heads are unloaded using energy extracted from the spinning disks. This patented power-saving feature helps to reduce overall maintenance costs and extends the drive service life.

Another contributor to CinemaStar 7K100's exceptional shock performance and power savings is the use of compact, low-mass femto air-bearing sliders.

### Extended field reliability

An integrated thermal sensor monitors operating temperature, enabling the host processor to intelligently adjust airflow as needed for cooling. Sensor integration reduces component cost and increases reliability.

CinemaStar 7K1000's thermal fly-height control (TFC) uses an integrated heating ele-

HITACHI
Inspire the Next

## CinemaStar 7K1000 Specifications

| Model(s) | HCS721075KLA330 | HCS721010KLA330 |
|---|---|---|
| Interface | Serial ATA 3.0 Gb/s | |
| Capacity[1] | 750 GB | 1 TB |
| Sector size | 512 bytes | |
| Disks/heads | 4/8 | 5/10 |
| **Performance** | | |
| Data buffer[2] | 32 MB | |
| Rotational speed | 7200 RPM | |
| Simultaneous SD/HD streams | 10 | |
| Media transfer rate (max) | 1070 Mb/s | |
| Interface transfer rate (max) | 300 MB/s | |
| Latency | 4.17 ms (average, 7200 RPM) | |
| Silent-seek time[3] | 14 ms read (typical), 15 ms write (typical) | |
| **Reliability** | | |
| Error rate (non-recoverable) | 1 per 1.0 E15 bits transferred | |
| Load/unload cycles (at 40°C) | 50,000 | |
| Warranty | 3 years | |
| Availability[4] | 24x7 | |
| **Power** | | |
| Supply | +5 VDC (+/- 5%), +12 VDC (+10% / -8%) | |
| Start up current (max) | 2.0 A (+12V), 1.2 A (+5V) | |
| Silent read/write (average) | 9.9 W | 10.8 W |
| Idle (average) | 8.1 W | 9.0 W |
| Unload idle | 6.4 W | 6.9 W |
| Low RPM idle | 4.3 W | 4.5 W |
| **Acoustics (A-weighted sound power)** | | |
| Idle | 2.9 bels (typical) | |
| Silent seek | 3.0 bels (typical) | |
| **Physical** | | |
| Dimensions | H (26.1 mm) x W (101.6 mm) x D (147 mm) | |
| Weight (max) | 700 g | |
| **Environmental** | | |
| Temperature | 5 to 60 °C operating, -40 to 70 °C non-operating | |
| Relative humidity (non-condensing) | 8 to 90% operating, 5 to 95% non-operating | |
| Shock (half sine wave) | 70 G/2 ms pulse operating, 300 G/1 ms pulse non-operating | |
| Vibration (random) (RMS) | 0.67 G horizontal, 0.56 G vertical operating, 1.04 G XYZ non-operating | |
| RoHS[5] compliant | yes | |

[1] GB equals one billion bytes when referring to hard drive capacity; accessible capacity may be less.
[2] Buffer capacity includes 270 or less KB used for drive firmware.
[3] Excludes command overhead
[4] Intended for low duty cycle, non mission-critical applications in PC, nearline, and consumer electronics environments, which may vary from application to application
[5] RoHS refers to the European Union Directive 2002/95/EC on the restriction of certain hazardous substances in electrical and electronic equipment.

Specific application environments such as temperature and duty cycle will affect the overall reliability rates.
For specific application environment reliability rates, please consult Hitachi technical support.

ment to precisely maintain a constant fly-height through-out read and write operations. This reduces the raw soft error rate and, in turn, improves overall data integrity, drive performance and reliability.

CinemaStar 7K1000's iridium-manganese-chromium (IrMnCr) read head sensor technology offers better performance and reliability in harsh conditions.

### Drive security

Drive security is provided through host-drive authentication (secure key exchange) during installation. Host-drive pairing ensures drives will only work with authorized hosts in the event of theft.

### Hitachi Design Studios

Located around the world, Hitachi Design Studios assist customers with all aspects of integrating hard drives into consumer electronic devices. Their services focus on drive selection, evaluation and optimization, integration and design-in consulting, software compatibility assessment, performance profiling, problem analysis and reliability consulting.

### Hitachi quality and service

All Hitachi hard drives are designed to the highest quality standards with field-proven components. They are backed by Hitachi's worldwide technical support and integration services, enabling global customers to bring their products to market quickly.

### Information and Technical Support

www.hitachigst.com (Main Web site)
www.hitachigst.com/partners (Reseller Web site)

**North America**
support_usa@hitachigst.com
Toll free: 1 888 426-5214, Direct: 1 507 322-2370

**Asia Pacific**
support_ap@hitachigst.com / 65 6840 9595

**EMEA and UK**
support_uk@hitachigst.com / 44 20 7133 0032

**Germany**
support_uk@hitachigst.com / 49 6929 993601

Hitachi Global Storage Technologies trademarks are intended and authorized for use only in countries and jurisdictions in which Hitachi Global Storage Technologies has obtained the rights to use, market and advertise the brand. Contact Hitachi Global Storage Technologies for additional information. Hitachi Global Storage Technologies shall not be liable to third parties for unauthorized use of this document or unauthorized use of its trademarks.

References in this publication to Hitachi Global Storage Technologies' products, programs, or services do not imply that Hitachi Global Storage Technologies intends to make these available in all countries in which it operates.

Product specifications provided are sample specifications and do not constitute a warranty. Information is true as of the date of publication and is subject to change. Actual specifications for unique part numbers may vary. Please visit the Support section of our website, www.hitachigst.com/support, for additional information on product specifications. Photographs may show design models.

© 2007 Hitachi Global Storage Technologies

Hitachi Global Storage Technologies
3403 Yerba Buena Road
San Jose, CA 95135 USA

Produced in the United States 1/07. Revised 4/07, 9/07.
All rights reserved.

CinemaStar™ is a trademark of Hitachi Global Storage Technologies.

Hitachi Global Storage Technologies